

What is claimed is:

1 A system for inserting an electronic watermark data comprising:

DCT converter for extracting a block of $k \times k$ pixels from an original image, subjecting said block to DCT (discrete cosine transform), and then outputting data after the DCT conversion;

quantizer for quantizing DCT coefficients output from said DCT converter;

movement decision means for deciding the magnitude of a movement based on a generation amount from said DCT converter;

picture-type decision means for deciding a picture type;

an electronic watermark data table for storing first to j -th electronic watermark data and electronic watermark data of $(j \times 2)$ types having said movement, for each picture type;

electronic watermark data selector for selecting said electronic watermark data of one type according to said picture type and said movement; and

electronic watermark data inserter means for inserting said selected electronic watermark data into data after said DCT conversion;

whereby the magnitude of a movement is decided by

obtaining a difference between a DCT coefficient of a front frame and a DCT coefficient of a rear frame and electronic watermark data with a suitable strength is inserted according to the magnitude of said movement.

5 2 A system for inserting an electronic watermark data comprising:

DCT converter for extracting a block of $k \times k$ pixels from an original image, subjecting said block to DCT (discrete cosine transform), and then outputting data after the DCT conversion;

quantizer means for quantizing DCT coefficients output from said DCT converter means;

movement decision means for deciding the magnitude of a movement based on a generation amount from said DCT converter means;

picture-type decision means for deciding a picture type;

original electronic watermark data memory for storing original electronic watermark data;

j first multipliers each for subjecting said original electronic watermark to multiplication data according to said picture type;

an electronic watermark data table for storing electronic watermark data of j types ranging from the first electronic watermark data to j-th electronic


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 watermark data being outputs from said j multipliers;
 electronic watermark data selector for selecting
 electronic watermark data of one type among said
 electronic watermark data of j types;

5 a second multiplier for subjecting said selected
 electronic watermark data to multiplication according
 to the magnitude of a movement obtained based on a
 difference between said DCT coefficients; and
 electronic watermark data insertion means for inserting
 10 electronic watermark data obtained through
 multiplication by said second multiplier into data
 after said DCT conversion;

whereby the magnitude of a movement is decided by
 obtaining a difference between a DCT coefficient of a
 15 front frame and a DCT coefficient of a rear frame and
 electronic watermark data with a suitable strength is
 inserted according to the magnitude of said movement.

3 A Apparatus for inserting an electronic watermark data
 comprising:

20 a DCT converter for extracting a block of $k \times k$ pixels
 from an original image, subjecting said block to DCT
 (discrete cosine transform), and then outputting data
 after the DCT conversion;
 a quantizer for quantizing DCT coefficients output from
 25 said DCT converter;


 a movement decision unit for deciding the magnitude of
 a movement based on a generation amount from said DCT
 converter;

a picture-type decision unit for deciding a picture
 type;

an electronic watermark data table for storing first to
 j-th electronic watermark data and electronic
 watermark data of $(j \times 2)$ types having said movement,
 for each picture type;

an electronic watermark data selector for selecting
 said electronic watermark data of one type according
 to said picture type and said movement; and

an electronic watermark data inserter for inserting
 said selected electronic watermark data into data
 after said DCT conversion;

an inverse quantizer for inverse-quantizing a block of
 $k \times k$ pixels in which said electronic watermark data
 is inserted; and

an IDCT covnerter for performing an IDCT (discrete
 cosine transform) of a block of $k \times k$ pixels in
 which said electronic watermark data inverse-
 quantized is inserted.

4 An apparatus for inserting an electronic watermark data
 comprising:

a DCT converter for extracting a block of $k \times k$ pixels

from an original image, subjecting said block to DCT
 (discrete cosine transform), and then outputting data
 after the DCT conversion;
 a quantizer for quantizing DCT coefficients output from
 said DCT converter;
 a movement decision unit for deciding the magnitude of
 a movement based on a generation amount from said DCT
 converter;
 a picture-type decision unit for deciding a picture
 type;
 an electronic watermark data table for storing first to
 j-th electronic watermark data and electronic
 watermark data of $(j \times 2)$ types having said movement,
 for each picture type;
 an electronic watermark data selector for selecting
 said electronic watermark data of one type according
 to said picture type and said movement; and
 an electronic watermark data inserter for inserting
 said selected electronic watermark data into data
 after said DCT conversion; and
 a Huffman encoder for encoding data after insertion of
 said electronic watermark data.

5 An apparatus for inserting an electronic watermark data
 comprising:
 a DCT converter for extracting a block of $k \times k$ pixels

from an original image, subjecting said block to DCT
(discrete cosine transform), and then outputting data
after the DCT conversion;

5 a quantizer for quantizing DCT coefficients output from
said DCT converter;

a movement decision unit for deciding the magnitude of
a movement based on a generation amount from said DCT
converter;

10 a picture-type decision unit for deciding a picture
type;

original electronic watermark data storage means for
storing original electronic watermark data;

15 j first multipliers each for subjecting said original
electronic watermark to multiplication data according
to said picture type;

an electronic watermark data table for storing
electronic watermark data of j types ranging from the
first electronic watermark data to j-th electronic
watermark data being outputs from said j multipliers;

20 an electronic watermark data selector for selecting
electronic watermark data of one type among said
electronic watermark data of j types;

a second multiplier for subjecting said selected
electronic watermark data to multiplication according
25 to the magnitude of a movement obtained based on a

5 difference between said DCT coefficients; and
an electronic watermark data inserter for inserting
electronic watermark data obtained through
multiplication by said second multiplier into data
after said DCT conversion;
an inverse quantizer for inverse-quantizing a block of
k \times k pixels in which said electronic watermark data
is inserted; and
10 an IDCT covnerter for performing an IDCT (discrete
cosine transform).

6 The apparatus for inserting an electronic watermark
data defined in Claim 5, wherein said first multiplier and
said second multiplier are omitted when said
multiplication coefficient is 1.

15 7 An apparatus for decoding an electronic watermark data
comprising:
a decoder for extracting and decoding block data of a
size of k \times k pixels decoded by the electronic
watermark data inserter;
20 an IDCT converter for IDCT converting said block data
decoded;
an electronic watermark data extractor for obtaining
the number of electronic watermark data to be
extracted based on information on the location where
25 said block data of a k \times k pixel size is extracted

and then extracting electronic watermark data from
data after IDCT conversion output from said IDCT
converter;

5 extracted data storage means for storing data extracted
by said electronic watermark data extractor; and
an electronic watermark data detector for extracting
electronic watermark data at a corresponding location
by means of said extracted data storage means and
said electronic watermark table after said extracted
10 data storage means has stored extracted data for one
screen and then calculating a statistical similarity,
thus outputting a calculation result.